

IN THE CLAIMS:

Claims 4, 5, 13-15, 17, 48, 55, 56, 58, 61, 62, and 66-85 were previously canceled. None of the claims have been amended herein. All of the pending claims are presented below for convenience of the Examiner. This listing of claims will replace all prior versions and listings of claims in the application. Please enter these claims as previously amended.

1. (Previously presented) An evaporator for a heat transfer system, the evaporator comprising:  
a heated wall having a heat-absorbing surface adjacent to a heat source;  
a liquid barrier wall containing working fluid on an inner side of the liquid barrier wall, which fluid flows only along the inner side of the liquid barrier wall;  
a primary wick extending from a portion of the heated wall to a portion of the liquid barrier wall;  
a vapor removal channel located at an interface between the primary wick and the heated wall and formed in at least one of an inner surface of the heated wall and an outer surface of the primary wick; and  
a liquid flow channel located at an interface between the liquid barrier wall and the primary wick and formed in at least one of an inner surface of the liquid barrier wall and the outer surface of the primary wick.
2. (Previously presented) The evaporator of claim 1, further comprising additional vapor removal channels located at the interface between the primary wick and the heated wall.
3. (Previously presented) The evaporator of claim 1, further comprising additional liquid flow channels located at the interface between the liquid barrier wall and the primary wick.
4. (Canceled)
5. (Canceled)

6. (Previously presented) The evaporator of claim 1, wherein the vapor removal channel is formed in the inner surface of the heated wall.

7 (Previously presented) The evaporator of claim 6, wherein the vapor removal channel is electro-etched into the heated wall.

8. (Previously presented) The evaporator of claim 6, wherein the vapor removal channel is machined into the heated wall.

9. (Previously presented) The evaporator of claim 1, wherein a first portion of the vapor removal channel is formed in the inner surface of the heated wall and a second portion of the vapor removal channel is formed in the outer surface of the primary wick.

10. (Previously presented) The evaporator of claim 9, wherein the first portion of the vapor removal channel is electro-etched into the heated wall.

11. (Previously presented) The evaporator of claim 9, wherein the first portion of the vapor removal channel is machined into the heated wall.

12. (Previously presented) The evaporator of claim 1, wherein the vapor removal channel is formed in the outer surface of the primary wick.

13.-15. (Canceled)

16. (Previously presented) The evaporator of claim 1, wherein the liquid flow channel supplies the primary wick with liquid from a liquid inlet.

17. (Canceled)

18. (Previously presented) The evaporator of claim 1, further comprising:  
additional vapor removal channels located at the interface between the primary wick and the heated wall; and  
additional liquid flow channels located between the liquid barrier wall and the primary wick;  
wherein the number of vapor removal channels is higher than the number of liquid flow channels.

19. (Previously presented) The evaporator of claim 1, further comprising:  
a secondary wick disposed between the liquid flow channel and the primary wick; and  
a vapor vent channel at an interface between the secondary wick and the primary wick.

20. (Previously presented) The evaporator of claim 19, wherein vapor bubbles formed within the vapor vent channel are swept through the secondary wick and through the liquid flow channel.

21. (Previously presented) The evaporator of claim 19, wherein the vapor vent channel delivers vapor that has vaporized within the primary wick at a location proximate to the interface between the primary wick and the liquid barrier wall away from the primary wick.

22. (Previously presented) The evaporator of claim 19, wherein the secondary wick is a mesh screen.

23. (Previously presented) The evaporator of claim 19, wherein the secondary wick is a slab wick.

24. (Previously presented) The evaporator of claim 1, wherein the primary wick, the heated wall, and the liquid barrier wall are annular and coaxial.

25. (Previously presented) The evaporator of claim 24, wherein the heated wall is disposed inside the primary wick, which is disposed inside the liquid barrier wall.

26. (Previously presented) The evaporator of claim 1, wherein the vapor removal channel is thermally segregated from the liquid flow channel.

27. (Previously presented) The evaporator of claim 1, wherein the liquid barrier wall comprises fins disposed on an outer surface of the liquid barrier wall that cool a liquid side of the evaporator.

28. (Previously presented) The evaporator of claim 1, wherein the liquid barrier wall is cooled by passing liquid across an outer surface of the liquid barrier wall.

29. (Previously presented) A heat transfer system comprising:  
an evaporator including:

- a heated wall having a heat-absorbing surface adjacent to a heat source;

- a liquid barrier wall containing working fluid on an inner side of the liquid barrier wall,  
which fluid flows only along the inner side of the liquid barrier wall;

- a primary wick extending from a portion of the heated wall to a portion of the liquid barrier wall;

- a vapor removal channel located at an interface between the primary wick and the heated wall and formed in at least one of an inner surface of the heated wall and an outer surface of the primary wick, the vapor removal channel extending to a vapor outlet; and

- a liquid flow channel located at an interface between the liquid barrier wall and the primary wick and formed in at least one of an inner surface of the liquid barrier wall and the outer surface of the primary wick, the liquid flow channel receiving liquid from a liquid inlet;

a condenser having a vapor inlet and a liquid outlet;

a vapor line providing fluid communication between the vapor outlet and the vapor inlet; and  
a liquid return line providing fluid communication between the liquid outlet and the liquid inlet.

30. (Previously presented) The heat transfer system of claim 29, wherein the liquid barrier wall of the evaporator comprises heat exchange fins disposed on an outer surface of the liquid barrier wall.

31. (Previously presented) The heat transfer system of claim 29, further comprising a reservoir in the liquid return line.

32. (Previously presented) The heat transfer system of claim 31, wherein the evaporator further comprises:  
a secondary wick disposed between the liquid flow channel and the primary wick; and  
a vapor vent channel at an interface between the secondary wick and the primary wick.

33. (Previously presented) The heat transfer system of claim 32, wherein vapor bubbles formed within the vapor vent channel are swept through the secondary wick, through the liquid flow channel, and into the reservoir.

34. (Previously presented) The heat transfer system of claim 32, wherein the vapor vent channel delivers vapor that has vaporized within the primary wick at a location proximate to the interface between the primary wick and the liquid barrier wall away from the primary wick and into the reservoir.

35. (Previously presented) The heat transfer system of claim 31, wherein vapor bubbles are vented into the reservoir from the evaporator.

36. (Previously presented) The heat transfer system of claim 31, wherein the reservoir is cold biased.

37. (Previously presented) The heat transfer system of claim 29, wherein the evaporator is planar.

38. (Previously presented) The heat transfer system of claim 29, wherein the evaporator is annular such that the heated wall is inside the primary wick, which is inside the liquid barrier wall.

39. (Previously presented) The heat transfer system of claim 29, wherein liquid returning into the evaporator from the condenser is subcooled by the condenser.

40. (Previously presented) The heat transfer system of claim 39, wherein an amount of subcooling produced by the condenser balances heat leakage through the primary wick.

41. (Previously presented) The heat transfer system of claim 39, further comprising a reservoir in the liquid return line.

42. (Previously presented) The heat transfer system of claim 41, wherein subcooling maintains a thermal balance within the reservoir.

43. (Previously presented) The heat transfer system of claim 41, wherein the liquid return line enters the evaporator through the reservoir.

44. (Previously presented) The heat transfer system of claim 41, wherein the reservoir is formed adjacent the liquid barrier wall of the evaporator.

45. (Previously presented) The heat transfer system of claim 41, wherein the reservoir is formed between the liquid barrier wall and the primary wick of the evaporator.

46. (Previously presented) The heat transfer system of claim 41, wherein the reservoir is formed as a separate vessel that communicates with the liquid inlet of the evaporator.

47. (Previously presented) The heat transfer system of claim 41, wherein the reservoir comprises fins disposed on an outer surface of the reservoir that cool the reservoir.

48. (Canceled)

49. (Previously presented) The heat transfer system of claim 29, wherein the heated wall contacts a hot side of a Stirling cooling machine.

50. (Previously presented) The heat transfer system of claim 29, wherein the liquid flow channel is fed with liquid from a reservoir located above the primary wick.

51. (Previously presented) The heat transfer system of claim 50, wherein the liquid barrier wall is cold biased.

52. (Previously presented) An evaporator for a heat transfer system, the evaporator comprising:

a heated wall having an annular shape and a heat-absorbing surface adjacent to a heat source;

a liquid barrier wall having an annular shape and being coaxial with the heated wall;

a primary wick extending from a portion of the heated wall to a portion of the liquid barrier wall

and being coaxial with the heated wall, wherein the heated wall is positioned within a portion of both the liquid barrier wall and the primary wick;

a vapor removal channel located at an interface between the primary wick and the heated wall;

and

a liquid flow channel located at an interface between the liquid barrier wall and the primary wick.

53. (Previously presented) The evaporator of claim 52, wherein the heated wall is inside the primary wick, which is inside the liquid barrier wall.

54. (Previously presented) The evaporator of claim 52, further comprising a subcooler adjacent the liquid barrier wall.

55. (Canceled)

56. (Canceled)

57. (Previously presented) The evaporator of claim 52, wherein the liquid flow channel supplies the primary wick with liquid from a liquid inlet.

58. (Canceled)

59. (Previously presented) The evaporator of claim 52, wherein the vapor removal channel is formed in an inner surface of the heated wall.

60. (Previously presented) The evaporator of claim 52, wherein the vapor removal channel is formed in a portion of the primary wick and a portion of the heated wall.

61. (Canceled)

62. (Canceled)

63. (Previously presented) The evaporator of claim 52, further comprising: a secondary wick disposed between the liquid flow channel and the primary wick; and a vapor vent channel at an interface between the secondary wick and the primary wick.



64. (Previously presented) The evaporator of claim 52, wherein the vapor removal channel is formed in an outer surface of the primary wick.

65. (Previously presented) The evaporator of claim 52, wherein the liquid barrier wall comprises fins disposed on an outer surface of the liquid barrier wall that cool a liquid side of the evaporator.

66.-85. (Canceled)